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The Institutional Salesman

NATIONAL LUBRICATING GREASE INSTITUTE

VOLUME VI • NUMBER 6 SEPTEMBER, 1942

Program—10th Annual Meeting
of the
NATIONAL LUBRICATING GREASE INSTITUTE

MONDAY, OCTOBER 26—MORNING SESSION

9:30 A. M.

REGISTRATION

ADDRESS BY PRESIDENT SYDNEY BEVIN

ADDRESS OF WELCOME

Past President W. H. Saunders, Jr., of New Orleans

"THE PROPER APPLICATION OF LUBRICATING GREASES TO MACHINERY"

Mr. Charles Kraus—Alemite Division, Stewart-Warner Corporation

Speaker from the American Red Cross, National Headquarters, Washington, D. C.

AFTERNOON SESSION

2 P. M.

"ARMY GREASE DEVELOPMENTS"

Mr. Walter Ainsley

Consultant on Fuels and Lubricants, Office of Chief Ordnance Division

"THE FLOW CHARACTERISTICS OF LUBRICATING GREASES"

Messrs. A. Beerbower, L. W. Sproule, J. B. Patberg and J. C. Zimmer

To be presented by Dr. J. C. Zimmer — Esso Laboratories

"LOW TEMPERATURE CHARACTERISTICS OF GREASES"

Mr. Thomas A. Maxwell — International Lubricant Corporation

TUESDAY, OCTOBER 27—MORNING SESSION

9:30 A. M.

Individual meetings of the various Committees

To be attended by Committee Members only

AFTERNOON SESSION

2 P. M.

A TIMELY ADDRESS OF SPECIAL INTEREST TO GREASE INSTITUTE MEMBERS

Mr. Ralph Nicholson, Publisher of the *New Orleans Item*

"SURVEY OF LUBRICATING GREASE TEST METHODS"

Mr. C. W. Georgi — Enterprise Oil and Grease Corporation

"THE RAILROAD ASPECT OF LUBRICATING GREASES"

Mr. Charles B. Bryant — Southern Railroad System

COCKTAIL HOUR

Members and Guests are Cordially Invited as Guests of N. L. G. I.

(Continued on Page 3)

GREASE
FROM THE CONTAINER TO THE BEARING

(Extract from a Publication of the Socony-Vacuum Oil Co., Inc.)

By A. C. SUTSON

The purpose of this article is to discuss storage, handling, and application of grease in industrial plants from the time it is received on the purchaser's platform to the time that it is placed in the bearing. This phase of the question, which is a very important one, is too often neglected by users of grease, and consequently, inefficiencies, wastage, and frequently unnecessarily high costs result.

It is certainly true that there has been a tremendous accumulation of interest in establishing the proper procedure for handling and applying greases. In the past, there has been many a plant executive who was meticulous in the care, selection, and application of lubricants to his own personal automobile and yet permitted one of his most inefficient plant employees to handle the greasing of his industrial machinery. The results of such a procedure were to increase maintenance costs and to waste grease. Today, maintenance cost is far over-shadowed by loss of production. For every hour a machine is out of service for adjustment, overhaul, or repair, there are just so many less shells, so many less tanks or planes rolling off the line.

An additional problem of operation today is that repair parts for industrial machinery are frequently difficult or practically impossible to secure.

STORAGE

Cleanliness is most important in the handling and storage of grease. Dust, dirt, and contamination in grease can cause failure of bearings. Grease passages can become clogged and prevent grease from reaching the bearings. Particles of dirt drawn into the pressure area of a bearing can cause scoring. Ball and roller bearings with their fine finish and precision fit can pit and fail if dirt particles get on the highly polished races.

Grease containers should be stored in a room free from dust and dirt. Tops of containers should never be left off. A grease pump fitted into the container and having a dust tight top is an excellent method of handling.

The grease storage room should be maintained at normal temperatures. In bitter cold weather or winter, if the storage room is not heated, grease becomes hard and difficult to get into the grease guns. Until it has warmed up to normal temperatures, grease is more difficult to pump through the gun or to force into the bearing in a grease cup. The storage room should be properly heated, but in the design of the heating system, care must be taken to prevent the storage of drums of grease against or on top of steam lines. Unusual temperatures shorten the life of grease as they increase the rate of oxidation.

DISTRIBUTION OF GREASE

Grease from the central storage room may be distributed in small pails or containers for transference into grease cups, or in guns for use on grease fittings. From a cleanliness standpoint, the worst offenders probably are the open buckets with no covers. These are carried about through the plant, collect dust and dirt from the air, are frequently set down in dirty places and so accumulate abrasive materials which will tend to cause wear of bearings and clogged grease passages. Where small containers are used in carrying grease from the storage room to various parts of the plant, they must have tight covers; but what is more important, the covers must be kept on and kept tight. A cover is no good unless it is utilized to prevent dirt from getting into the grease. Covers which are lost, knocked off, or bent should be replaced or repaired.

These small containers should have a regular period of cleaning. Probably everyone has seen at various times a grease bucket which has been in service for a long time without being cleaned. In the bottom and encrusted on the sides of such buckets are usually grimy, black deposits of mixed dirt and old grease. Particles of this get mixed up with the new grease; and when they are introduced into the bearing, may, and probably will, cause trouble. Dirty, splintered wooden paddles should not be used for applying grease from the bucket to the grease cup. Stout metal paddles are best. They are easily cleaned and wiped off, and should be kept clean.

Buckets or paddles used for one type of grease should never be used for another type of grease unless they are first thoroughly cleaned. The reason for using different types of grease is to meet operating requirements; and when greases are mixed, the characteristics of the grease to meet those requirements are not retained.

In each storage room there should be a bench of adequate size with a metal top and proper compartments for grease guns, fittings, and replacement parts. The metal top table can be kept clean easily. Grease guns should be overhauled and filled on this table and not on dirty floors. A regular period of overhaul and cleaning should be set up for grease guns. They are machines and must be maintained or they will not operate efficiently. It was noted in one plant several years ago, that an operator filled a grease gun, "greased" about forty bearings, and on returning to the grease room, it was found that there still was just about as much grease in the gun as when it was originaly filled. Inspection showed that the mechanism of the gun was out of order and that there has been actually no grease put into the bearings. This sort of practice results in ruined machinery.

In grease guns as in containers, there should be a thorough cleaning of a gun before a different type of grease is ever placed into it. One efficient way to handle this situation is to use a code color for each type of grease and paint the gun so that only one kind of grease is used in any one particular gun. This helps keep the wrong greases out of bearings.

One good method of assuring the correct grease in the proper bearing is to use different types of fittings, one kind for each group of bearings requiring a particular type of grease. Since the grease gun can pump only through the fittings for which it is made, mistakes, followed by possible bearing troubles and expense, are eliminated. If one grease were suitable for all bearings, it would be used. Where different greases are used, there is a sound maintenance and operating reason for doing so.

Grease guns must not be laid down in dirty places or they will get dirt in the nozzle which will then be forced into the bearing. Grease fittings must always be wiped off with a clean wiping cloth before the grease gun nozzle is fitted on. This keeps dirt out of the bearing. This simple precaution will save many dollars in reduced maintenance and loss of machine production.

Grease is selected primarily to lubricate the bearings. Only secondarily it is selected for easy pumping out of a grease gun. Where it is necessary, in order to secure

(Continued on Page 4)

The INSTITUTE SPOKESMAN

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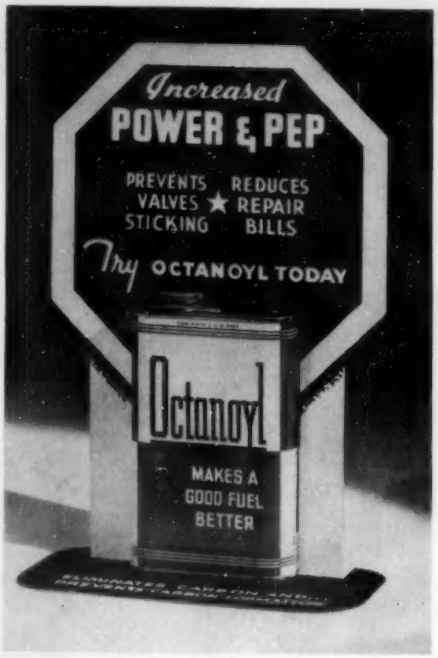

With greater care for automobiles uppermost in the motorists minds these days, this new OCTONOYL display message "strikes home" in a big way, according to dealers who are using it, sells quickly too, say the manufacturers, the Calumet Refining Company of Chicago, Illinois.

Printed in a striking maroon, the display piece stands twelve inches from top to base. Cut from a single piece of sturdy display board, this colorful OCTONOYL card uses an ingenious die-cut loop which fits snugly around the cap of the can, and holds the display sturdily erect. The pint size, orange and white OCTONOYL can rests on the base and completes the display.

The copy on the base of the display reads "Eliminates carbon and . . . prevents carbon formation."

HOTEL RESERVATIONS

If you have not already made your hotel reservations, contact Mr. Roy Bartlett, The Roosevelt Hotel, New Orleans, at once to insure satisfactory accommodations.

SPECIAL NOTICE

To members and guests — Your ladies are cordially invited — a special registration and fine program of entertainment and sight-seeing has been arranged for their enjoyment.

Program—10th Annual Meeting, N. L. G. I.—Continued

TUESDAY EVENING—ANNUAL BANQUET

7:30 P. M.
ENTERTAINMENT DELUXE

WEDNESDAY, OCTOBER 28—MORNING SESSION

9:30 A. M.

"A REVIEW OF RUST PREVENTIVES AND SUGGESTED PLAN FOR THEIR VALUATION"
MR. S. L. BISHKIN—Humble Oil and Refining Company

"CHANGE IN GREASE MANUFACTURE WHICH IS NECESSARY DUE TO THE GOVERNMENT'S NEED FOR ADDITIONAL QUANTITIES OF GLYCERINE"
Representative of U. S. Government, Washington

"LUBRICANTS FOR ANTI-FRICTION BEARINGS IN WAR SERVICE"
MR. O. L. MAAG—Timken Roller Bearing Company

AFTERNOON SESSION

2 P. M.

Annual Business Session — Active Members Only
Election of Directors

ROOSEVELT HOTEL

New Orleans, Louisiana
OCTOBER 26, 27 and 28, 1942

SEE SPECIAL NOTICE *above about Ladies' Program*

GREASE FROM CONTAINER TO BEARING

(Continued from Page 2)

correct lubrication, to use a grease too stiff to pump easily in a push type gun, then it is best to use a lever type or some other gun which will feed more easily. Grease guns are cheaper than shut-downs for repairs caused by the use of incorrect greases.

Grease in a screw-down cup is of no value unless the cup is turned at regular intervals to feed more grease into the bearing. If a screw-down cup is on a moving part and cannot be turned, an automatic type cup should be used in order to secure constant feed.

Where grease fittings or cups are in locations difficult to reach, use tubing or pipe out from the bearing to an easily accessible place and put the fitting or cup on the end of the tube. A ladder is easy to fall from, a moving machine part may take off a hand. Safety hazards should be eliminated. If it is easy to grease, a bearing will be more certain to get grease. Time of greasing is saved, and more bearings can be serviced.

ORGANIZATION

The organization of the personnel to do the greasing is one of the important parts of handling and application. In a small plant, it is frequently possible for one man working part time to take care of all the machinery. The usual method for handling this situation is to have the man arrive sufficiently ahead of time in the morning to do the greasing and then to have him stagger his lunch hour so that he can take care of the machinery while the operators are stopped for lunch.

In large plants where a number of men may be necessary to take care of the lubrication, regular routes should be planned and followed and each man made responsible for the machines in his route.

In large plants, the supervision of the men is quite frequently under the eye of a special lubricating engineer. In other locations, it has been the practice to put lubrication under the maintenance superintendent with the idea that poor lubrication increases the work of the maintenance crew and that, consequently, he is most vitally interested in securing efficient lubrication. The selection of the supervisor, whether he be operating or maintenance man, is usually affected considerably by the internal organization and type of plant operated.

Training of personnel is extremely important, and an informed man is able to produce better results than one who is simply shoving a lubricant into a bearing. Some lubricant suppliers maintain a technical staff who are capable of lecturing to and training the lubricating personnel of the plant. Today, with the rapid changes occurring in all manufacturing, it is more difficult to secure experienced men, and consequently, new men must be carefully selected and educated on their jobs.

Confusion and troubles can be minimized by the use of charts detailing the locations and types of lubricants to be used on each machine. Some plants have installed color code systems where each grease fitting or application device on the machine is painted a special color denoting the type of lubricant to be applied. For rapidly changing personnel, it is much easier to tell a man to put the grease from the red gun into the red fittings and the yellow gun into the yellow fittings than to attempt to educate him to a complete understanding of the machines and their requirements.

Plant experience has proved that when informed operators work under the correct planning, wear, overheating, and failure of machines from lubricating causes are eliminated. Production is maintained.

The problem of packing ball and roller bearings is very important, and it is felt that there is still much to be done in proper education on this subject.

Improper packing of ball and roller bearings is the most common cause of overheating and failure. If the bearing space is completely filled with grease, the balls or rollers have to force their way through it. Try moving your finger fast through grease. It takes a good hard push. Imagine the push it takes for all the balls or rollers in a bearing, moving at high speed, to force their way through a solid mass of grease. This fluid friction loss goes into heat. A ball bearing which was heated up to 250°F. has been dropped down to room temperature simply by opening the grease plug and letting the excess grease push out of the bearing. Then the balls had a space to push the grease and they could pick up the small quantities necessary for their lubrication. In a plant having anti-friction bearings, the power saving to be secured by proper packing can pay the lubricating cost of these bearings.

Most anti-friction bearings are made with tight seals. Forcing grease into them under high pressure with a grease gun will burst the seals. When the seals are once ruined, the bearing will leak until the seals are repaired. Many leaky ball bearings are caused by careless greasing.

With correct grease and tight seals, ball bearings need only be greased yearly, and for some types of operation this period may be longer. With poor or broken seals, constant checking is required, more grease is applied, and more grease comes out. In such locations, as in electric motors where grease can get on the windings and cause deterioration, or where grease can get on the product being manufactured, this carelessness may well be a vital factor.

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The correct filling for ball and roller bearings should not be more than one-third full in the bearing or working space. The grease in the sealing space is not in contact with running balls or rollers and this space should be full. Since the capacity of many bearings is seldom known by the user, it is difficult to measure the correct quantity to be fed to each bearing. The most practical method is to remove the grease plug, pump new grease in until it comes out of the bottom plug, and then run the bearing for about five minutes. This permits the bearing to force out all the excess grease. The grease plug should then be replaced; and with tight seals, and the correct grease, the bearing should be re-greased at about yearly intervals. This takes more time to do properly, but has to be done once a year with the correct grease. Improper packing may require daily care and take up much more time over the year.

If it is impossible to take the bearing down and clean it when putting a new type of grease in it, the bearing should be filled with carbon tetrachloride and run for a few minutes without load. The grease plug is then pulled and the bearing allowed to drain. In some cases, several flushes may be necessary in order to clean thoroughly. After cleaning, the bearing should be filled as recommended.

Where bearings do not have a bottom drain plug, it is in the long run most advisable to install one. If this is impossible, however, the use of carbon tetrachloride is not recommended as it may be trapped in the bearing and can eventually cause corrosive action. In such cases, it is recommended, therefore, that the bearing be dismantled and cleaned.

The permissible length of time between applications of grease can only be set properly by experience. Clearance of bearings, loads, temperature, grooving, alignment, and vibration all have their effects.

The best method is to set the frequency of greasing by the requirement of those bearings on the machine which are subjected to the most severe service. Then all bearings will be properly protected against excessive wear. Greasing labor and grease are cheaper than repairs and loss of production from machine outage. Generally speaking, grease lubricated plain sleeve bearings do not get enough grease. Even with correct greases, few plain bearings can operate without excessive wear for more than a day with only one greasing; most should be greased at least every eight hours; and many need applications at two to four hour periods where service is severe.

Only a man bent on sabotage would consciously throw abrasives or dirt into bearings, and all men interested in efficient operation and high production are anxious to keep the machines running. We are all prone to carelessness in our own personal actions or there would be no need for safety programs in factories. We need just as much to be reminded and informed on the hazards encountered by the machinery when we can help that machine by preventing their occurrence. The "ALWAYS BE CAREFUL" which protects the life and limb of the machine operators should be extended to include the "health of the machine" so that it is not damaged and laid up.

Conservation . . . or Extinction

THE CHOICE THAT FACES THE CIVILIAN TRUCKING INDUSTRY

By R. F. SNYDER

CHEK-CHART *Sales Director*

How important is the U. S. TRUCK CONSERVATION CORPS recently announced by the Office of Defense Transportation?

How critical is the situation that brought it into being?

How serious is the need for active and sustained cooperation by every man and every organization engaged in civilian trucking or having a stake in its preservation?

The answers to these questions may be found in the facts—cold, hard, unchangeable facts recently released by O.D.T. and reported in a recent bulletin of the National Petroleum Association.

They show that there are left in the government-controlled pool of new heavy trucks reserved for civilian use a total of only 6,000 units—a stage of depletion so acute that monthly allotments already have been slashed from 1,600 to 500 in an effort to delay complete exhaustion of the supply for at least a year.

ONLY 78,000 TRUCKS

They disclose an equally alarming condition in the field of light and medium trucks, with the same danger of depletion within 12 months. Of the former there are about 20,000 available and of the latter approximately 52,000 — a grand total of 78,000 trucks to meet other than direct government needs which, in normal times, required no less than 700,000 units a year! And when those 78,000 are gone, there will be no more—even for civilian uses ordinarily considered essential.

These are the facts, and no amount of wishful thinking will change them. They leave the truck owner with two alternatives: He must either conserve the equipment he has — make it last for the duration — or face the loss of his trucking facilities.

By the same token, oil companies and

(Continued on Page 7)

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The Draper Manufacturing Co.
Cleveland, Ohio

"Too Little and Too Late"

Neglect of Lubrication and Preventive Maintenance Reveals Huge Economic Waste From Car Breakdowns

"Too little and too late!" How often have we seen this tragic phrase applied to the military efforts of some members of the United Nations as the explanation for an Allied failure at some point of conflict with the Axis! It is an expression that has come to be associated in the public mind with improper or inadequate preparation. It means the failure to anticipate sufficiently in advance detrimental effects to follow at a strategic point that has not been properly protected against breakdown or collapse.

"Too little and too late!" That phrase has equally deep significance as applied to automotive parts, engine failures or breakdowns. Lack of adequate attention to the normal preventive maintenance measures which car owners should naturally observe in the operation of their automobiles, if they are to expect proper performance, is responsible for most mechanical failures.

So often, the car owner discovers all "too late" that his neglect to institute protective measures in time has resulted in bearing, parts or tire failures that are not only costly but tragic, because the conditions that brought them about are in most part largely avoidable.

Of all the reasons for mechanical failures, neglect of lubrication stands highest on the list. If all cars in service, by some super-human process were rigidly serviced at 1,000 mile intervals, engine oil changed, all lubrication points checked and schedules set for application of correct lubricants precisely at the correct mileage interval, and at the same time a check-up was made as to loose bolts, nuts, irregularities and tire condition, the tremendous toll in failures and breakdowns would be amazingly re-reduced.

But with no such super-human control system possible, the matter of lubrication is left to the caprice of whim of the car owner, or to the indifference of some station operator, with the result that the annual loss from unnecessary breakdowns or car tie-ups, reaches staggering figures.

These reflections on the economic waste from mechanical failures or breakdowns are occasioned by a recent release of some highly illuminating statistics bearing on the subject. We refer to a table on page 77, showing causes for 31,000,000 automobile breakdowns during 1941 as reported by the American Automobile Association's emergency road service department. The figures, reproduced in an accompanying table are based on reports from 12,000 garages throughout the country under contract to render service to AAA members.

The AAA figures reveal a huge economic waste, the larger portion of which could be eliminated by careful advance planning and attention by the car owner and neighborhood service station in carrying out periodic lubrication schedules and inspections at correct mileage intervals. Revealed in the table is the colossal carelessness and thoughtlessness of the average car owner. Nearly 10,000,000 breakdowns were due to tire troubles, occasioned in most cases, by lack of proper care and inspection. Another million curbside calls sprang from empty gas tanks. Heedless of their gasoline gages, 1,000,000 car owners blithely sail along until the gas in the tank runs out!

What more evidence is needed that the average car owner needs a custodian, someone to watch and check his car for him like a guardian patrol. It is the same with battery failures; nearly 5,000,000 of them. Inspection and recharge in time would have prevented such failures.

Certainly the number of breakdowns shown in the table could have been tremendously reduced by a systematic lubrication and inspection service religiously applied to cars. The truth of this statement, we feel, would be readily acknowledged by AAA officials. In answer to a query on this point, one AAA executive in the Chicago Motor Club, one of the largest AAA membership groups in the country, declared that fully 90 per cent of the mechanical failures represented in the table could have been prevented had the cars been operated under a rigid periodic lubrication and inspection control.

This executive declared that 9 out of the 10 breakdowns caused by mechanical failures, such as fan belt bearings, water pump bearings, and other lubrication-connected troubles, could have been avoided if steps had been taken in time to see that the strategic points of wear received lubrication in strict accord with the car manufacturers' recommendations, and if at the same time careful inspection had been given to check for loose nuts, bolts or improper parts adjustments. He agreed that getting the cars in for lubrication on a regular systematic basis provided the greatest opportunity for catching irregularities before they could become permanent defects resulting in failures.

The trouble is that the average motorist is too complacent, too indifferent about anticipating the needs of his car. Questioned on this he will for the most part concede that with periodic lubrication and regular inspection, actual or incipient defects can be promptly detected that will often prevent mechanical failures. But even with Pearl Harbor to wake him up, he is doing very little to take the steps necessary to protect his car. Now that his car is a national asset in our victory effort, the car owner needs a guardian, a custodian as never before.

Something should be done to dispel the complacent attitude of the average car owner, to make him realize that his car is in trust with him as a national asset, one that must be preserved and its life prolonged as a war measure. To change that attitude of the motorist, is an important mission of the station operator. For no group in the automotive industry today is in such position to counsel car owners wisely as is the petroleum marketers.

And because his own survival during the emergency is so closely linked with CONSERVATION MAINTENANCE, emergency measures may be in order on the part of the petroleum marketer if he is to dissipate the car owners' indifference to car conservation. He must declare war, so to speak, on owner complacency and compel the owner to see the light by giving him educational lessons in sound lubrication procedure.

The car owner must be told, as all the men supervising and operating our army vehicles are being told today, that lubrication of a motor vehicle on a systematic schedule of mileage intervals is the chief single factor in insuring longer vehicle life, greater freedom from operating trouble and minimum maintenance and repair work.

When a car is on the lift for lubrication service, attendants should take the time to examine the oil filter. In the interests of CONSERVATION MAINTENANCE, this is an important step. A clogged oil filter is worse than useless, and may be a source of danger if the motorist is depending on this to keep his oil clean.

Total number of automotive breakdowns in 1941, according to the AAA was 31,000,000 as compared with 35,000,000 calls in the preceding year.

"These figures," said Thos. P. Henry, of Detroit, Mich., President of the AAA, "show the need for maintaining an adequate supply of trained automobile mechanics to keep our motor vehicles moving and the equally important need for providing tire equipment for the thousands of emergency repair trucks."

(Continued on page 7)

Oil's Critical Jobs Listed by Hershey

NPN News Bureau

WASHINGTON—Assurance that "necessary men" employed in the petroleum industry "will receive the classification to which they are entitled," was given by Selective Service Director Hershey to Deputy Petroleum Coordinator Davies.

Total of 112 classifications were listed as "critical occupations" by General Hershey who said that this type classification had been approved by War Manpower Comm.

OCCUPATIONS LISTED

Following occupations in petroleum, natural gas and natural gasoline industries are in Occupational Bulletin No. 15 which points out that such jobs are "restricted to occupations requiring 6 months of training and preparation":

accountant
acid recovery plant operator
analyst, geophysical
blacksmith
boilermaker
brickmason, refractory
carbon black plant operator
carpenter
cementing (well) operator
chemist
chief clerk
claim adjuster
coke burner
coke-oven mason
coke-oven repairman
compounder
computer, geophysical
core analysis operator
dehydration plant operator
derrickman
designer, equipment
dispatcher
draftsman
driller
electrical logging operator
electrician
engineer operating, chief station
engineer operating, chief station, boilerhouse
engineer operating, compressor
engineer operating, hoist
engineer operating, locomotive
engineer operating, natural gas
engineer operating, power
engineer operating, processing
engineer operating, supervising
engineer operator, processing
engineer, professional and technical
ethyl blender
filter house operator
fishing tool operator
foreman, boilermaker
foreman, carpenter
foreman, coal washing
foreman, coke products
foreman, communications
foreman, electrician
foreman, filler and package
foreman, fire crew
foreman, coal products
foreman, gas measurement
foreman, heat treating
foreman, insulator
foreman, leads
foreman, machine shop
foreman, maintenance and repair
foreman, petroleum refining
foreman, pipe shop
foreman, production
foreman, rigbuilding
foreman, shipping
foreman, tank cleaning
gas-lift plant operator
gasoline plant operator
generator operator
geologist
geophysicist
glass blower (instrument)
grease maker
gun-perforating operator
houseman
inspector, mechanical
instrument repairman
insulator, boiler, steam, etc.
interpreter, geophysical
laboratory technician (semi-prof.)
landman, chief or division
lead burner
machinist
maintenance mechanic
manager, employment
manager, office
manager, operators
manager, personnel
manager, traffic
material and warehouse inspector
material inspector
metal and equipment inspector
metallurgist
oil blender
oil pumper, refinery (operator in charge)
party chief, geophysical
physicist
pipe fitter
powerhouse switchboard controller
purchasing agent
rigger
seismologist
sheet-metal worker
shooter, oil well
stillman
tank builder
test-engine operator
tool dresser
tool pusher
topman
treater, oil well acidizing
treating plant operator
washerman
wax-plant operator
welder, combination
welder, high pressure
yardmaster

"Too Little and Too Late"—*(Continued from Page 6)*

CAR BREAKDOWNS IN 1941 REPORTED FROM AAA STATIONS

	Number of Breakdowns		Percentage of Total	
Type of Service	1941	1940	1941	1940
Tire	9,505,000	9,668,000	30.7	27.7
Ignition	4,548,000	4,608,000	14.7	13.2
Battery	4,538,000	5,035,000	14.6	14.4
Tow	3,069,000	4,350,000	9.9	12.4
Stuck (sand, mud, snow)	1,429,000	1,462,000	4.6	4.2
Wrecker-Crane	1,234,000	1,315,000	4.0	3.8
Out of Gas	1,163,000	1,521,000	3.8	4.3
Starter	955,000	1,255,000	3.1	3.6
Lock and Key	691,000	472,000	2.2	1.4
Gas Line	589,000	1,112,000	1.9	3.2
Carburetor	589,000	469,000	1.9	1.3
Frozen	109,000	189,000	.4	.5
Miscellaneous	2,582,000	3,510,000	8.3	10.0

Total number of automotive breakdowns in 1941, according to the AAA was 31,000,000 as compared with 35,000,000 calls in the preceding year.

Conservation or Extinction

(Continued from Page 5)

their dealers have their choice of cooperating in the conservation movement or risking the loss of a big and desirable market for their products and services.

We cannot eliminate heat and friction in truck operation, but we can forestall their damage by insulating critical parts with the proper types and grades of lubricants. And since lubricants and lubrication are the province of the oil companies, it would seem that their first and logical function in the U. S. TRUCK CONSERVATION movement lies in helping every truck owner to derive all the life-preserving and operating cost reduction benefits from complete and correct lubrication.

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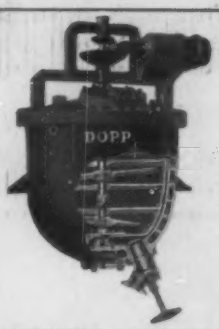

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